Electro-Textiles for Future Soldier Systems

Overview:

Electronic devices are being miniaturized for personal use, however; no technology exists to integrate electronics into clothing. Combat clothing materials are passive and electronics are needed to provide enhanced capabilities. In addition, the need for real time information technology on the battlefield is well documented. The proposed overall solution to these issues is the development of a wearable personal area network providing data and power transmission that is lightweight, low cost, and can be integrated into any garment.

Description:

The future soldier system electronic network has been mapped for the Scorpion program. This network will serve as the soldier's electronic backbone. A prototype USB 2.0 bus has been successfully developed and functionally demonstrated. A variety of COTS conductive materials, including metallic and composite yarns, have been integrated into narrow fabrics. These electro-textiles possess the required electrical performance as well as traditional textile characteristics such as flexibility, launderability, durability and a flat profile.

Status:

Variations of the USB 2.0 bus and related connectors, which have been modified to accommodate soldier wearable applications, are under development and are being integrated into the Scorpion system. A field demonstration of the Scorpion system including the personal area network is scheduled for FY03. The electro-textile development work has been conducted under the Small Business Innovative Research (SBIR) Program and numerous versions of the power and data bus have been transitioned to private industry for a variety of uses including Malden Mill's novel Polartec electric blanket and Xybernaut's wearable computer system. Applications for domestic and international patent rights have been submitted and are currently under evaluation.

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